A PROPOSAL TO MANAGE COYOTE AND COUGAR POPULATIONS OF THE JUNCTION WILDLIFE MANAGEMENT AREA

Ministry of
Environment and Parks
Williams Lake, B.C.

Wildlife Working Report No. WR-30
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by

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WILDLIFE BRANCH

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OBJECTIVES

1. to monitor and improve lamb survival of the Junction sheep herd through the removal of coyotes during the winter and spring of 1986/87 and 1987/88.

2. to radio collar and monitor cougar populations at the Junction and/or Deer Park to determine spatial and temporal use of the sheep range by season, seasonal density and sex and age-specific predation by cougar for sheep.

3. to reduce the coyote population to a point where lamb-ewe ratios increase to at least 25-35 lambs/100 ewes in March. Approximately one coyote/25-50 km^2 will remain on the Junction and will ensure that coyote predation will remain an integral part of the predator-prey interaction on the Junction. Immigration from surrounding areas will continue to repopulate the area at this low to moderate level.

4. to alter the age structure of the adult ewe population to a normal age distribution to reduce the impact of severe winters.

5. to maintain the sheep population at 400-500 sheep, allowing a surplus of 20-30 sheep annually, for transplant either within B.C. or to vacant habitat in the United States, and/or allowing a harvest of 10-15 ewes/year for recreation and for analysis of stress, disease, condition and food habits. Management of the cougar population should increase the male sheep harvest from 50 to 100%.

6. to maintain sheep population and harvest objectives, approximately 1 adult cougar/60 km^2 will be maintained within the study area. Preliminary investigations suggest that 8-12 cougars (1 adult cougar/20-30 km^2) currently inhabit the area during the breeding season. During the non-breeding season, approximately 4-6 adult cougars inhabit the study area.

BACKGROUND

The Junction California bighorn sheep range lies at the confluence of the Fraser and Chilcotin Rivers (Junction Management Plan) (Figure 1). There are currently 400 - 500 sheep in the area (Hebert, unpubl. data). It is the largest, northernmost California bighorn sheep population in North America and has been the source of sheep for the reintroduction program to other parts of B.C. and to the six western states. Since 1954, approximately 250 sheep have been transplanted from this population.

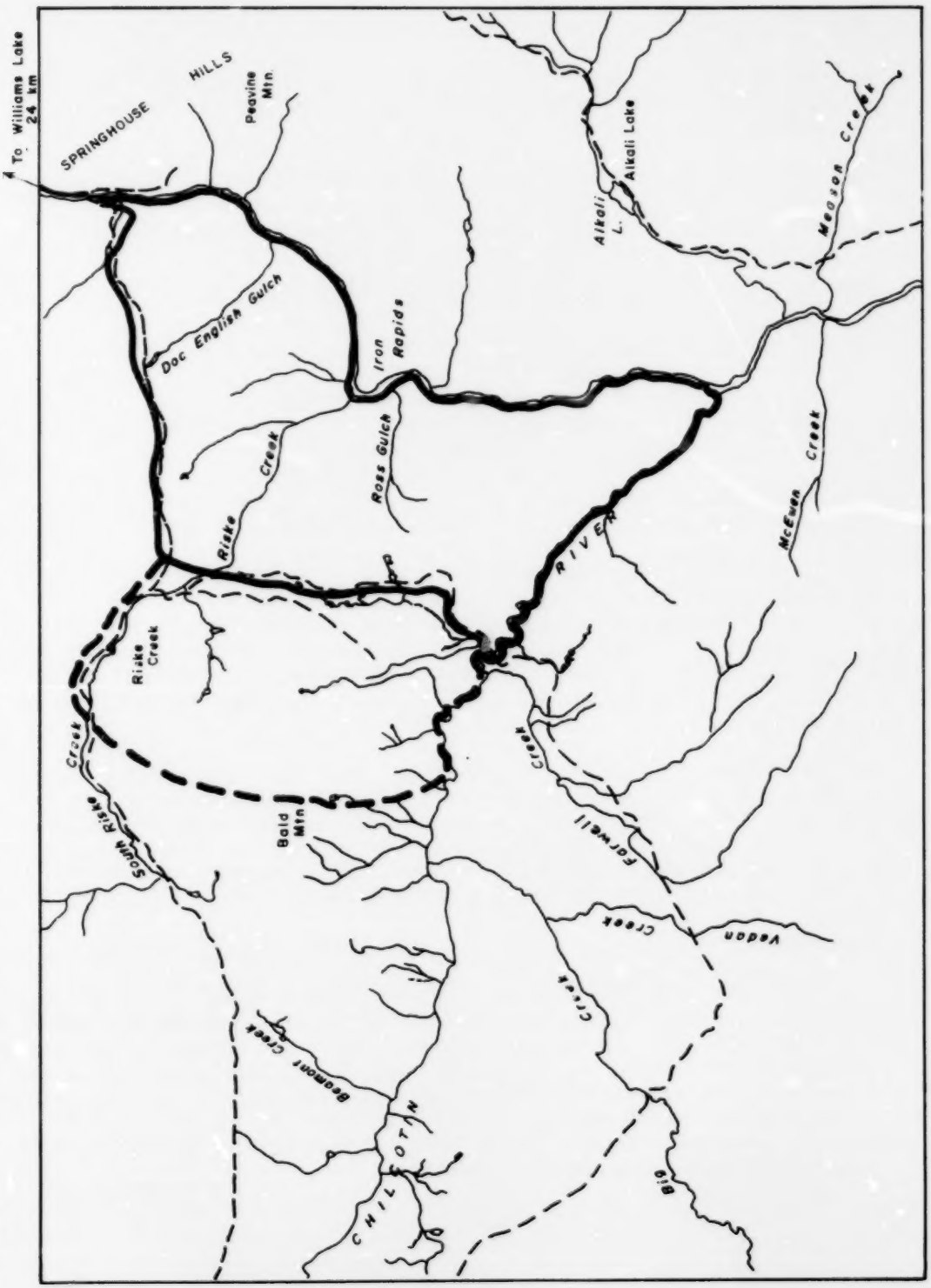

Figure 1. The Approximate Study Area of the Cougar - Coyote Management Proposal.

During the past 4 years, lamb survival decreased, even though winter weather was moderate to mild. Lamb survival appears to have been low during the 1970's as well (Mitchell, unpubl. data). Lamb productivity and survival have been studied for the past 3 years. The investigations included: determination of pregnancy, lamb survival patterns, range investigations and mapping, food habits work, animal and population condition studies, sex and age determination of stress levels, forage selection studies, physiological parameters, pathological determination of disease and parasite levels, marked - unmarked estimation of population size, and, replication surveys to estimate population size and lamb survival on the Junction as well as on the adjoining Deer Park herd. A draft report has been prepared; the final report should be ready in 6 months.

These studies showed that limiting factors such as range, nutrition, disease and weather, apparently are not significant in the regulation of the Junction sheep herd or in the lamb mortality patterns that are occurring. At the Deer Park Ranch, however, where ranch employees have undertaken a coyote control program, lamb survival is 3 to 4 times higher than at the Junction.

The purpose of these investigations is to understand the dynamics of predator-prey interactions on the Junction sheep range to assess the magnitude of predators as a limiting factor to population growth and ram survival. Once the data are accumulated, objective decisions can be made on the allocation of the resource among predators, transplants and hunter harvest.

Through trapping and transplant operations, it has been determined that the female segment of the population is skewed to the older age classes (6-8+ years). With high lamb mortality, a severe winter could drastically increase the adult mortality and severely reduce the population. Without a suitable understanding of the impacts of predators, population recovery could be severely impeded.

Upon determination of the magnitude and type of impact of each predator species, management by legal trapping of coyotes and harvesting of cougars will be undertaken through the regulations, bag limits and seasons lengths under the Wildlife Act.

STUDY AREA

The study area will encompass all land between the junction of the Chilcotin and Fraser Rivers to Highway 20 to the north (Figure 1), approximately 450 km^2.

BIOLOGICAL DATA

From May until August, lamb/ewe ratios on the Junction declined by 46% and 61% in 1984 and 1985, respectively (Figures 2 and 3). Further losses occurred from August until the following March, resulting in 13-18 lambs per 100 ewes.

Figures 2 and 3 also present corresponding data from the neighbouring Deer Park bighorn population, where the rancher removes 30-50 coyotes per year. The lamb/ewe ratios are consistently higher for all months; the pre-parturient ratio is 38 lambs per 100 ewes (Figures 2 and 3).

Seasonal segregation of the ewes and rams at the Junction was determined by Ashcroft (1986). The majority of rams utilize the Fraser River breaks (Figure 4) throughout the year, except during the rut. A portion of the ewe and ram ranges were examined and 37 carcasses (20 rams, 7 ewes, 6 unidentified) were identified (Figure 4). Cougar apparently were involved with 7 of the 20 ram mortalities. For the remaining 13 rams, mortality factors could not be determined, although cougar involvement was a possibility. During cougar tracking operations with dogs, four freshly killed rams were identified, all were cougar kills. One ram was a radio-collared study animal.

EXTENT AND DURATION OF PROGRAM

Coyotes will be removed during the legal trapping season (winter 86-87) by commercial trappers under permit. During the late winter and early spring (before and during lambing), trappers will be paid to remove coyotes with pelts that are not prime. Duration of the program will be 2 years (1986/87 - 1987/88).

Currently, a cougar radio tracking program is underway in the study area. Cougars will be radio collared in December - February. They will be monitored for 2 years. Monitoring will determine population size, distribution, and temporal and spatial use of the Junction area. In addition, sex and age selection of prey by cougars will be determined. Preliminary data suggest that cougar select mature rams in the fall after the rut. After the 2-year monitoring program, if shown to be necessary, cougar transplants will be initiated and/or cougar harvest will be undertaken by commercial guides under permit or by resident hunters. The level of harvest will be determined by the response of the sheep population to coyote control and by the impact on sex and age components of the sheep population by cougar.

EXPECTED IMPACT ON NON-TARGET SPECIES

There will be no impact on non-target species under either program.

EXPECTED BENEFITS

Management of coyote and cougar populations will identify proximate and/or ultimate limiting factors restricting the expansion of the Junction sheep population.

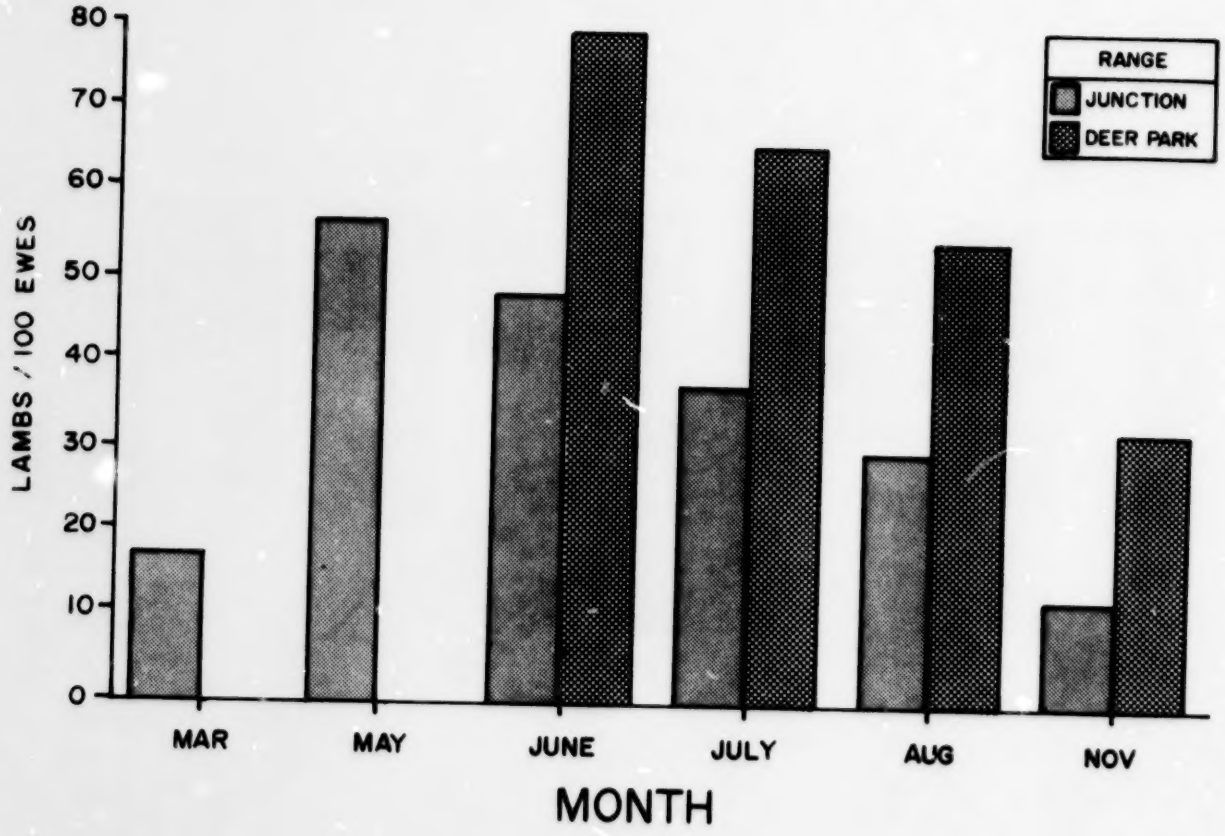

Figure 2. Lamb Ratios 1984, Junction vs Deer Park

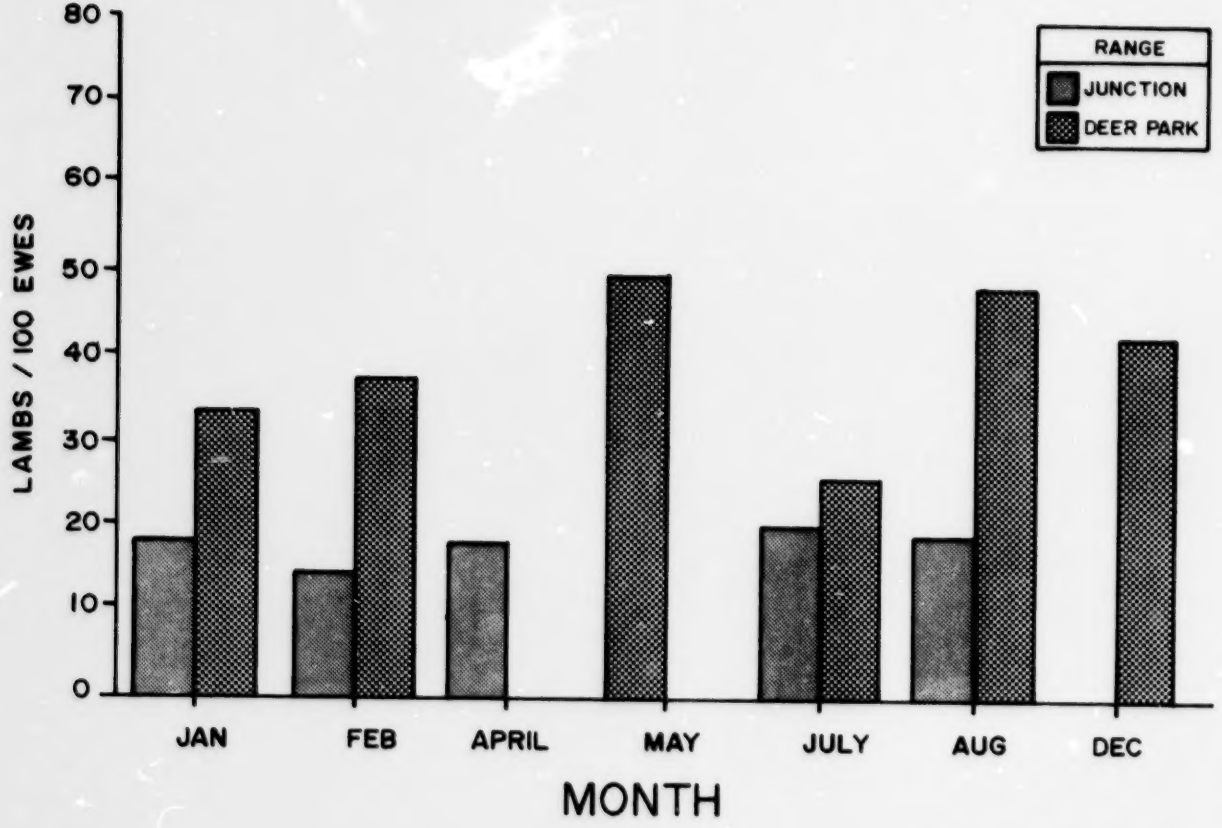

Figure 3. Lamb Ratios 1985, Junction vs Deer Park

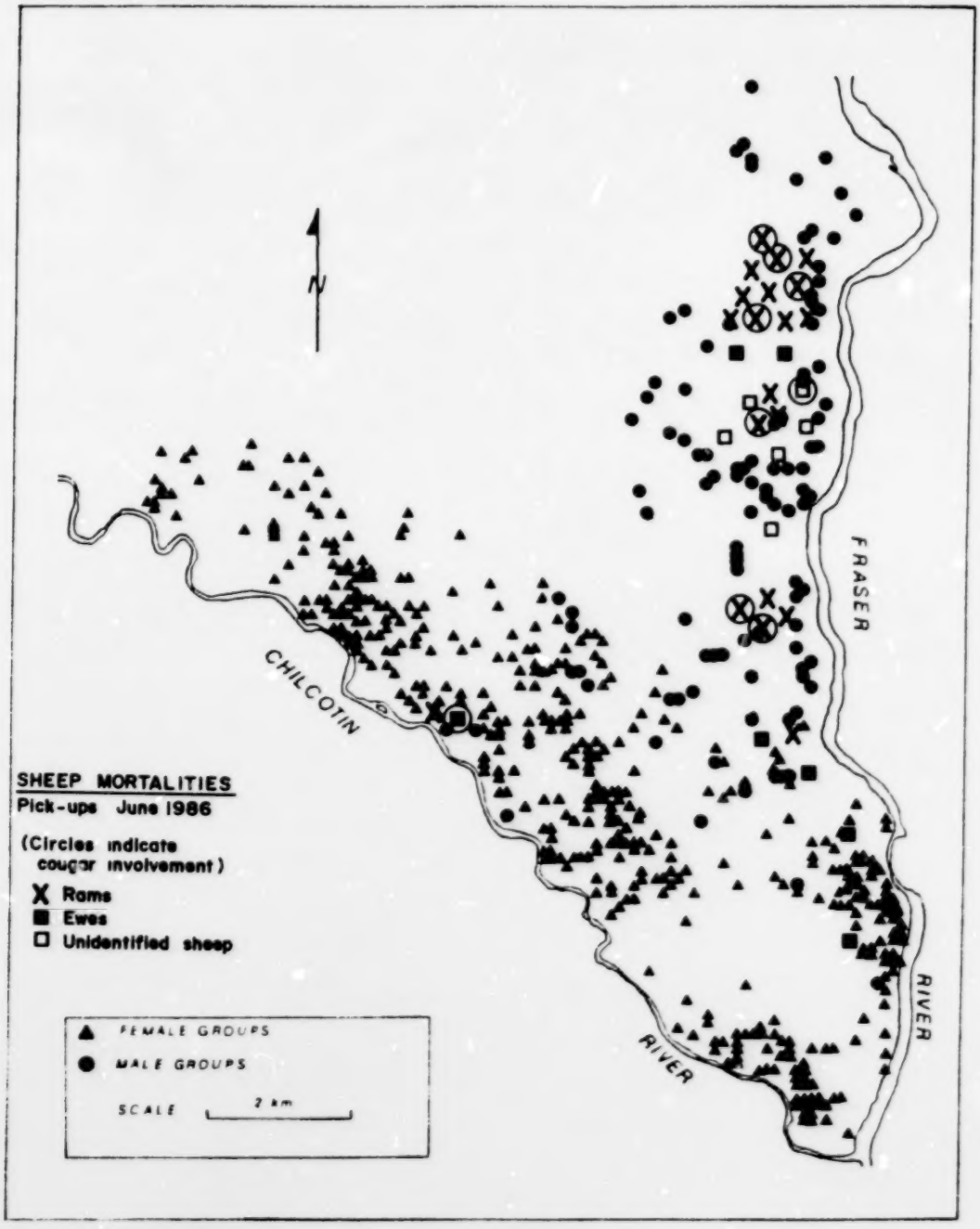

Figure 4. Locations of male and maternal groups outside of the fall mating period.

An expanding sheep population on the Junction can be beneficial in three ways:

1. increased ram harvest. At present, full curl rams are difficult to find and may be in low numbers due to cougar predation and poaching. Because there are 150 rams on the Junction, the level of utilization could be safely doubled to 10 rams per year with predator management. The value of the present harvest (5 rams per year) is about $1,420 (27 hunter days x $52.60 per day - R. Reid 1985). At 8% interest, the present discounted value of this recreation is $17,750. Doubling the harvest would increase the present discounted value to $35,500.

2. increased ewe harvest, which will produce a healthy expanding ewe population with a normal age distribution.

3. increased transplant program. There is still vacant California bighorn sheep habitat in the Kamloops and Williams Lake area. At least two sites will be restocked this winter. As sites are identified along the Fraser River, transplants will be designed and implemented. Approximately 250 tranplanted sheep have produced an additional 2500 California bighorn sheep in the U.S.A. and Canada. In the U.S.A., by restocking vacant sheep habitat, 7500 California bighorn sheep could be produced. In addition, heterozygosity should be maintained with animals from the northern distribution.

BUDGET AND WORK SCHEDULE

COYOTE

Den Identification	
Grad. Student	2 man-months
Wildlife Technician	2 man-weeks
Coyote Trapping	
Comm. Trapper	4-6 man-months
Wildlife Technician	2-4 man-weeks

COUGAR

Trapping and Collaring	
Grad. Student	4-6 man-months
Wildlife Technician & Bio.	4 man-weeks
Cougar Dogs & Trapper	2 man-months

BUDGET

Coyote	Den. Ident.	Trapping	Total
86-87	$ 1000	1000	2000
87-88		1000	1000

Cougar	Trapping	Monitoring	
86-87	$ 3000	3000	6000
87-88	2000	5000	7000

PROGRAM EVALUATION

1. The total sheep and lamb portion of the Junction population will be monitored to compare post control data with 3 years of pre-control information. Increases in the lamb population will probably result from coyote control. Ewe-lamb ratios should increase to 25-35 lambs/100 ewes. Cougar activity will be monitored specifically and the age and sex effects of cougar predation on the sheep population will be described and quantified.

   Sheep counts will be conducted in the winter by aerial flights and in the spring by a complete ground count (conducted for past 3 years) to assess lamb survival patterns.

2. Counts will be conducted at Deer Park to provide comparable data where coyotes have been controlled for the past few years.

3. During the program, cougar densities will be determined and used to develop management objectives for cougar populations, harvest and densities for coyotes will be measured for 2 years and will be used to develop population levels for coyotes.

4. This program is part of a larger academic study describing cougar-prey biology on the Junction sheep range. It will be evaluated as M.Sc. studies are completed and other scientific papers are prepared.

REPORTING SCHEDULE

Progress Report #1 - for both cougar and coyote April 30/87
Progress Report #2 - for both cougar and coyote April 30/88

Additional monitoring and seasonal reports will be completed as required.

ANTICIPATED PUBLIC REACTION

Since only a few predators will be transplanted or harvested through legal harvest under the Wildlife Act, there should be no negative public reaction. The proposal will be presented to the Problem Wildlife Advisory Committee.

LITERATURE CITED

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the preliminary nature of the data they contain

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